WRTK — Stores key assignments of system functions onto the medium. Uses ALPHA register.

WRTP — Stores a program and its key assignments onto the medium. Uses ALPHA register.

WRTPV — Stores a program and its key assignments onto medium and makes the file private. Uses ALPHA register.

WRTR — Copies all storage resisters into a data file. Uses ALPHA register.

WRTRX — Copies some storage registers into a data file as specified by X (bbb.eee). Starts at current register in data file.

WRTS — Stores calculator status onto the medium. Uses ALPHA register.

ZERO — Fills a data file with zero values. Uses ALPHA register.

## Mass Storage Flag

**Flag 11: Automatic Program Execution**
Used with WRTP, WRTPV, or WRTA, sets a program for automatic execution when copied back into the calculator from the keyboard. (For WRTA, execution set to start at current position in program memory.)

## Interface Control Operations

AUTOIO — Sets the interface to Auto mode.

FINDID — Finds the address of a specified device type and places the address in X. If the device is not found, zero is returned. Uses ALPHA register.

INA — Inputs an ALPHA string of up to 24 characters from primary device.

IND — Inputs a decimal number from primary device.

INSTAT — Inputs status information from primary device, sets or clears flags 00 through 07 accordingly, and places decimal status number in X.

LISTEN — Sets a device as a listener, or removes all listeners for X = 31. Uses X-register.

LOCAL — Sets primary device to its local operating mode.

MANIO — Sets the interface to Manual mode.

OUTA — Outputs an ALPHA string to primary device. Uses ALPHA register.

PWRDN — Sets all devices to their low power state.

PWRUP — Sets all devices to their operating power state.

REMOTE — Sets primary device to its remote operating mode.

SELECT — Selects a device as the primary device. Uses X-register.

STOPIO — Stops I/O communication in the loop.

TRIGGER — Triggers all devices set to respond (listeners).

## Interface Control Flags

**Flags 00 through 07: Device Status**
When set by INSTAT, indicate that corresponding status bits of a device are 1's.

**Flag 17: Suppress End-of-Line**
End-of-line indicator is not used. OUTA does not send CR and LF. INA ignores CR and LF.

**Flag 32: Manual Mode**
Indicates interface is in Manual mode.

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# HP 82160A HP-IL Module Quick Reference Card

While the HP 82160A HP-IL Module is plugged into the calculator, the following functions are available for your use. All functions are programmable except as noted below. Appropriate peripherals must be connected to the Hewlett-Packard Interface Loop for the functions to be executed normally.

Calculator flags indicated below determine how the interface module performs certain operations. When a flag is set, operations are performed as described.

## Printer Operations

Functions marked with * are for the HP 82162A Thermal Printer only.

ACA — Accumulates the ALPHA register into the print buffer.

ACCHR — Accumulates a character into the print buffer. Uses X-register.

ACCOL* — Accumulates a specified column of dots into the print buffer. Uses X-register.

ACSPEC* — Accumulates a special character into the print buffer. The character is defined by using BLDSPEC. Uses X-register.

ACX — Accumulates the X-register contents into the print buffer.

ADV — Advances the printer paper and prints the print buffer right-justified.

BLDSPEC — Executed up to seven times, builds a special character using specified columns of dots. Accumulate using ACSPEC or store in a register. Uses X- and Y-registers.

FMT* — Accumulates a format specifier into the print buffer. Leading or trailing specifier centers output; internal specifier prints left- and right-justified.

LIST — Lists specified program lines. Not programmable.

PRA — Prints the ALPHA register left-justified.

PRAXIS * — Prints and labels a *y*-axis. Uses $R_{00}$, $R_{01}$, $R_{02}$ (column width), $R_{04}$.

PRBUF — Prints the print buffer left-justified.

PRFLAGS — Prints flag status and other calculator information.

PRKEYS — Prints a list of currently reassigned keys.

PRP — Prints a program. Not programmable.

PRPLOT * — Plots a function interactively. Prompts for parameters and stores data in $R_{00}$ through $R_{11}$.

PRPLOTP * — Plots a function noninteractively. Uses $R_{00}$ through $R_{11}$: $R_{00}$ (Y MIN), $R_{01}$ (Y MAX), $R_{03}$ (optional plot symbol), $R_{04}$ (AXIS), $R_{08}$ (X MIN), $R_{09}$ (X MAX), $R_{10}$ (X INC), $R_{11}$ (NAME). $R_{06}$ contains *x* value.

PRREG — Prints the contents of all storage registers.

PRREGX — Prints the contents of registers specified by X (bbb.eee).

PR Σ — Prints the contents of the statistics registers.

PRSTK — Prints the contents of the X-, Y-, Z-, and T-registers.

PRX — Prints the contents of the X-register.

REGPLOT * — Plots a single function value (from X-register). Uses $R_{00}$, $R_{01}$, $R_{02}$ (nnn.aaa), $R_{03}$.

SKPCHR * — Accumulates skipped characters into the print buffer. Uses X-register.

SKPCOL * — Accumulates skipped dot columns into the print buffer. Uses X-register.

STKPLOT * — Plots a single function value using X (nnn.aaa), Y (Y MAX), Z (Y MIN), T (*y* value).

## Printer Flags

**Flag 12: Double Wide**
Prints and accumulates characters double width.

**Flag 13: Lowercase**
Prints and accumulates characters in lowercase.

**Flag 21: Printer Enable**
Performs printer operations normally in programs. VIEW and AVIEW print and do not halt program execution. (Automatically set when flag 55 is set.)

**Flag 55: Printer Existence**
Indicates a printer is connected to the system. (Automatically set when printer is first detected.)

**Flags 15 and 16: Print Mode (not used for HP 82162A Thermal Printer)**

| Flag 15 | Flag 16 | Print Mode |
|---|---|---|
| clear | clear | MAN (*manual*) |
| clear | set | NORM (*normal*) |
| set | clear | TRACE |
| set | set | TRACE with stack option |

## Mass Storage Operations

CREATE — Creates a new data file with specified number of registers and filled with zero values. Uses ALPHA and X-registers.

DIR — Displays (and prints) a directory of stored files. Indicates file type: PR (program), DA (data), KE (key assignment), ST (status), and WA ("write-all"). Indicates file options: A (automatic), P (private), and S (secure).

NEWM — Prepares a new medium for storing files. Prompts for number of files in directory space. Not programmable.

PURGE — Removes a file from the medium. Uses ALPHA register.

READA — Reads a "write-all" file and sets the calculator accordingly. Uses ALPHA register.

READK — Reads a key-assignment file and reassigns keys accordingly. Uses ALPHA register.

READP — Copies a program file into program memory, replacing the last program in memory. Executed in USER mode, program key assignments become active also. Uses ALPHA register.

READR — Copies a data file into the calculator's registers until all file registers copied or all storage registers filled. Uses ALPHA register.

READRX — Copies part of a data file into registers specified by X (bbb.eee). Starts at current register in data file.

READS — Reads a status file and sets the calculator status. Pending program returns are lost. Uses ALPHA register.

READSUB — Copies a program file into program memory, placing it after the last program in memory. Executed in USER mode, program key assignments become active also. Uses ALPHA register.

RENAME — Renames a stored file. Uses ALPHA register.

SEC — Makes a stored file secured against being erased, renamed, or altered. Uses ALPHA register.

SEEKR — Positions the medium to a specified data file and register. Uses ALPHA and X-registers.

UNSEC — Makes a stored file not secured. Uses ALPHA register.

VERIFY — Verifies that a stored file can be read. Uses ALPHA register.

WRTA — Stores a "write-all" file onto the medium. Uses ALPHA register.